The Abstract of the disclosure has been corrected to better reflect the critical details of the claimed invention per the Examiners instructions. No new matter is believed to have been added on entry of the above amendments.

Claims 1, 7, 15, 21 and 23 stand rejected under 35 U.S.C. § 112 second paragraph. Applicants respectfully traverse the rejection. One of ordinary skill in the art would clearly be aware of the temporal aspects related to administering the adjuvant and the substance on understanding the instant invention.

Claim 25 stands rejected as indefinite because of the singular article before "nasal". The rejection is respectfully submitted to have been obviated by amendment.

Claims 2-8, 13-16 and 18-25 have been objected to under 37 CFR 1.75 (c) as being of improper dependent from.

The objection to claims 2 and 3 is respectfully traversed. The "substance" in claim 1 has been clearly defined and further limited in each of subsequent claims 2 and 3. Moreover, the type of substance has been claimed, thus narrowing the scope of the dependent claim.

The objection of claims 4-8, 13-16 and 18-25 are respectfully submitted to have been obviated by amendment.

Claims 1, 4-8, and 13-16 stand rejected under 35 U.S.C. § 112, 1st paragraph as nonenabling for non-viral vaccines.

Applicants respectfully traverse the rejection of claims 1, 4-8 and 13-16 under 35 U.S.C. § 112 1st paragraph for non-enablement. Applicants note that the specification teaches on page 22 that corresponding results have been obtained with bacterial antigens such as *Neisseria meningitidis* and *Bordetella pertussis.* Applicants respectfully suggest that on understanding the concepts in the present invention, with a view to the above cited disclosure, one of ordinary skill

in the art would be able to prepare an appropriate formulation of a non-virial adjuvant formulation.

Claims 1-8 and 13-25 stand rejected as anticipated over the publication to Benach et al.

Benach et al. teaches using glucan (a glucose monomer-based polymer) in a vaccination protocol against murine *Babesia microti* infection. The glucan is taught as a beta-1,3-glucopyranose derivative of yeast cell walls. However, there is no additional teaching or description of the "glucan" besides beta-1,3-glucopyranose other than its derivation from yeast cell walls.

In contrast to Benach et al. the mucosal adjuvant composition of the instant invention comprises a branched beta-1,3-glucan that contains beta-1,3-linked side chains anchored by a beta-1,6-linkage to the beta-1,3-linked chains. This structure is not disclosed nor suggested in the Benach et al. publication. Benach et al. apparently only discloses linear beta-1,3-glucopyranose repeat units, without side chains. Additionally, Applicants respectfully disagree with the conclusion that Benach et al. inherently comprises molecules having the claimed structure of the instant invention. There is no factual evidence given to support such a conclusion, as there is no explicit disclosure of the same.

Claims 1-8 and 13-25 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,641,761 to Takahashi et al. Applicants respectfully traverse the rejection over Takahashi et al. for the following reasons.

Takahashi et al. teaches a preventive agent against infectious diseases in crustacea which incorporates a glucan described as consisting essentially of a main chain of beta-1,3-glucopyranosyl residues bearing beta-1,6-glucopyranose side chains. This describes glucopyranose, not pyranosyl side chains (see column 1, line 21, 22 and column 2, line 31, 32).

The glucopyranose nomenclature refers to a single monomer unit not an oligomeric or polymeric side chain.

Applicant's invention clearly differs from Takahashi et al. as the instantly claimed glucan is a branched beta-1,3-glucan that contains beta-1,3-linked side chains anchored by a beta-1,6-linkage to the beta-1,3-linked chains. The difference between the two is clear. The instant invention comprises beta-1,3- main chains and side chains, but bonded through a beta-1,6 linkage. Takahashi et al. teaches a beta -1,3-main chain but a beta-1,6-side chain unit. Applicants respectfully disagree with the conclusion that Takahashi et al. inherently comprises molecules having the claimed structure of the instant invention. There is no factual evidence given to support such a conclusion, as there is no explicit disclosure of the same.

Claims 1-8 and 13-25 stand rejected under 35 U.S.C. § 102(b) over Rorstad et al., U.S. Patent 5,401,727. Applicants respectfully traverse the rejection over Rorstad et al. for the following reasons. Rorstad et al. teaches a process for stimulating the immune system of aquatic animals of the class Osteichthyes and subphylum Crustacea and thereby enhancing their resistance to certain diseases in aquaculture. This reference teaches a process for preparing yeast glucan from saccharomyces cerevisiae, the glucan composed of glucopyranose units linked predominately by beta-1,3 glycosidic bonds, having at least one branch therefrom of glucopyranose units linked by beta-1,6 glycosidic bonds, which are said to stimulate the immune system of certain aquatic animals.

In contrast, Applicant's invention is a mucosal adjuvant composition that enhances the effect of medicinal substances administered onto mucosal surfaces, the mucosal adjuvant composition comprising a branched beta-1,3-glucan that contains beta-1,3-linked side chains anchored by a beta-1,6-linkage to the beta-1,3-linked chains. Applicant's invention is not related

to the use of glucans as a prophylactic medicament for aquatic animals but rather as an adjuvant, that is, a compound which enhances the effect of a composition comprising medicinal substances, specifically substances administered onto mucosal surfaces. Applicant's invention is thus directed to a different field than the Rorstad et al., U.S. Patent 5,401,727 reference.

This application is believed to be in condition for allowance and early favorable action is requested.

Respectfully submitted,

March 7, 2002

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CLAIMS PENDING IN APPLICATION FOLLOWING ENTRY OF AMENDMENT

VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Thice amended) A mucosal adjuvant composition that enhances the effect of medicinal substances administered onto mucosal surfaces, the mucosal adjuvant composition comprising a branched beta-1,3-glucan that contains beta-1,3-linked side chains anchored by a beta-1,6-linkage to the beta-1,3-linked chains.

2. The composition of claim 1 wherein the substance is a vaccine formulation.

3. The composition of claim 1 wherein the substance is an influenza virus vaccine.

4. (Amended) A method of administering the composition of claim 1 onto a mucosal membrane wherein the substance is administrated into the nasal cavity.

5. (Amended) A method of administering the composition of claim 1 onto a mucosal membrane wherein the substance is administrated orally.

6. (Twice amended) The composition of claim 1 wherein the substance forms a mixture [mixed] with the mucosal adjuvant composition.

7. (Twice amended) A method of administering the composition of claim 1 wherein the substance is administrated prior to the mucosal adjuvant composition.

8. (Twice amended) The composition of claim 1 wherein the substance and the mucosal adjuvant composition [are intended for administration] are used as [a] nasal spray.

13. (Amended) A method of administering the composition of claim 1 wherein the substance is [intended for] administered vaginally, rectally or gastriclly [administration].

14. (Amended) A method of administering the composition of claim 1 wherein the substance is administrated simultaneously with the mucosal adjuvant composition.

15. (Amended) A method of administering the composition of claim 1 wherein the substance is administrated after administration of the mucosal adjuvant composition.

16. (Amended) The composition of claim 1 wherein the substance and the mucosal adjuvant composition [are intended for administration] are formulated as [a] nasal drops.

17. A mucosal adjuvant composition that enhances the effect of an influenza virus vaccine administered onto mucosal surfaces, the mucosal adjuvant composition comprising glucose monomers linked together in branched beta-1,3 linked chains with beta-1,3,6 linked branching points comprising beta-1,3 linked or beta 1,6 linked side chains.

18. (Amended) A method of administering the composition of claim 17 onto a mucosal membrane wherein the influenza virus vaccine is administrated into the nasal cavity.

19. (Amended) A method of administering the composition of claim 17 onto a mucosal membrane wherein the influenza virus vaccine is administrated orally.

20. (Amended) The composition of claim 17 wherein the influenza virus vaccine is [mixed] admixed with the mucosal adjuvant preparation.

21. (Amended) A method of administering the composition of claim 17 wherein the influenza virus vaccine is administrated prior to the mucosal adjuvant composition.

22. (Amended) A method of administering the composition of claim 17 wherein the influenza virus vaccine is administrated simultaneously with the mucosal adjuvant composition.

23. (Amended) A method of administering the composition of claim 17 wherein the influenza virus vaccine is administrated after administration of the mucosal adjuvant composition.

24. (Amended) The composition of claim 17 wherein the influenza virus vaccine and the mucosal adjuvant composition are [intended for administration] formulated as [a] nasal spray.

25. (Amended) The composition of claim 17 wherein the influenza virus vaccine and the mucosal adjuvant composition are [intended for administration] used as [a] nasal drops.